Antibacterial activities of some plant extracts alone and in combination with different antimicrobials against multidrug-resistant \textit{Pseudomonas aeruginosa} strains

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ABSTRACT

\textbf{Objective:} To evaluate the possible \textit{in vitro} interaction between ethanolic extracts of \textit{Rhus coriaria} (\textit{R. coriaria}) (seed), \textit{Sacropoterium spinosum} (\textit{S. spinosum}) (seed), \textit{Rosa damascena} (\textit{R. damascene}) (flower) and certain known antimicrobial drugs including oxytetracycline HCl, penicillin G, cephalaxin, sulfadimethoxine as sodium, and enrofloxacin. This synergy study was carried out against 3 clinical strains of multidrug-resistant \textit{Pseudomonas aeruginosa} (\textit{P. aeruginosa}). \textbf{Methods:} Evaluation of synergy interaction between plant extracts and antimicrobial agents was carried out using microdilution method. \textbf{Results:} The results of this study showed that there is a decrease in the MIC in case of combination of ethanolic plant extracts and test antimicrobial agents. The most interesting result was that the combination between \textit{R. coriaria} and these antibiotics, showed a high decrease in minimum inhibitory concentration (MIC), and a strong bactericidal activity against these strains. \textbf{Conclusions:} These results may indicate that combinations between \textit{R. coriaria} extract and these antibiotics could be useful in fighting emerging drug–resistance \textit{P. aeruginosa}, which may due to that \textit{R. coriaria} extract contain natural inhibitors working by different mechanisms or inhibiting efflux pumps. Now we have experiments underway leading to the identification of the active molecules present in \textit{R. coriaria}. Further, \textit{in vivo} experiments are needed to confirm pseudomonal protection.

\textbf{Keywords:} Synergism; \textit{Rhus coriaria}; \textit{Sacropoterium spinosum}; \textit{Rosa damascena}; Medicinal plants; Antimicrobial agents; \textit{Pseudomonas aeruginosa}; Palestine

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